Civilian Applications of UAVs
A California Perspective,
a Policy Symposium

Applications In Emergency Response and Public Safety

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Center for Asymmetric Warfare

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The CAW Organization

- The Center for Asymmetric Warfare (CAW) was established in 1999 as a part of Naval Air Systems Command
- In 2008, CAW was realigned as a field experimentation activity of the Naval Postgraduate School
  - Support military forces and civil authorities in identifying, countering, and controlling the effects of asymmetric threats nationally and internationally
  - Test and evaluation of emerging technologies; including first response command and control, and emergency management applications
- CAW has the overall goal of improving interagency collaboration and response capability of the civil-military interface at all levels (DOD, Federal, State, Local, Pvt. Sector)
- Based at Naval Base Ventura County, Pt. Mugu

CAW UAV Systems Activities

- **Fire Fighting Tabletop Exercise 2010**
  - Sponsored by the Association for Unmanned Vehicle Systems International (AUVSI)
  - In partnership with training and subject matter experts from the U.S. Forest Service (USFS) and the Naval Postgraduate School's Center for Asymmetric Warfare
  - Four day event held at the Tooele County Emergency Management Emergency Operations Center and the US Army's Dugway Proving Ground in Utah

CAW UAV Systems Activities

November 2010

CAW UAV Systems Activities

- **Coastal Trident 2012 Regional Maritime Security Exercise**
  - Multi jurisdictional port and maritime focused exercise at the Port of Hueneme, Ventura and Los Angeles Counties
  - Exercise focused on regional maritime counter-narcotics, humanitarian assistance, and WMD response operations
  - 54 Participating agencies including, local, state, federal, DOD and private sector
  - Developing military and law enforcement technologies evaluated including security and humanitarian applications of maritime based UAV platforms

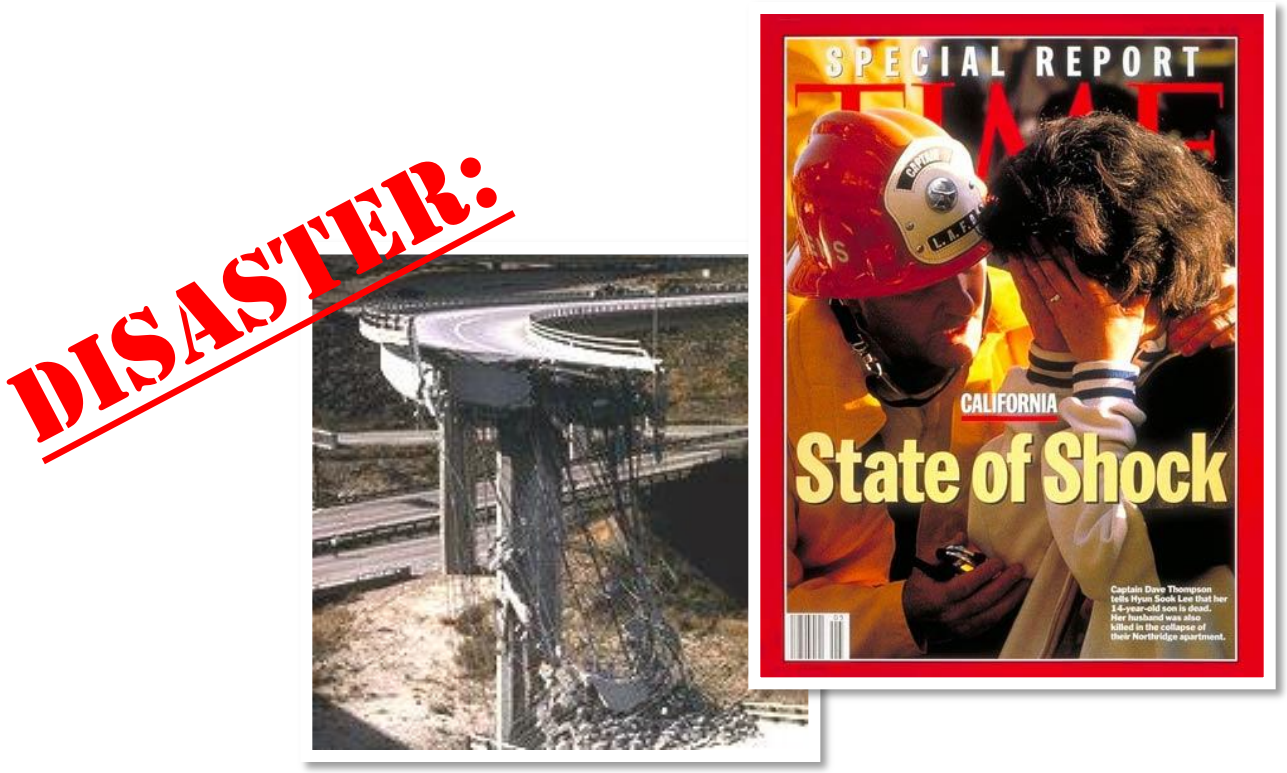
CAW UAV Systems Activities

- **Coastal Trident 2013 Regional Maritime Security Exercise**
  - Exercise is in planning phase and is scheduled for June 18-20
  - Like previous Coastal Trident exercises will involve agencies and organizations for every level of government and the private sector
  - Will focus on the threat posed by waterborne improvised explosive devices (WBIED)
  - Will include the evaluation of a number of UAV systems operating in the maritime environment
  - Exercise elements will explore use of UAVs in the detection and characterization of maritime threats and the protection of commercial shipping

UAV Applications in Emergency Management

Emergency Management

- **A "Disaster" by definition is:**
  - Any situation natural or manmade that poses a threat to life, property or the environment and which by its occurrence overwhelms local manpower, supplies or resources



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Expedite relief and recovery

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UAVs are a "Force Multiplier"

UAVs - Mitigation

- **UAVs have many applications that can assist authorities in mitigation efforts:**
  - Surveying wild land growth and fuel loads for clearing operations
  - Monitoring snow melt and storm runoff to prevent flooding
  - Monitor land movement, slides and subsidence
  - Determine status of transportation routes (roads, rail, water)
  - Studying wildlife and migration patterns
  - Mapping and documentation of pre-disaster conditions
  - Monitor potential criminal activities

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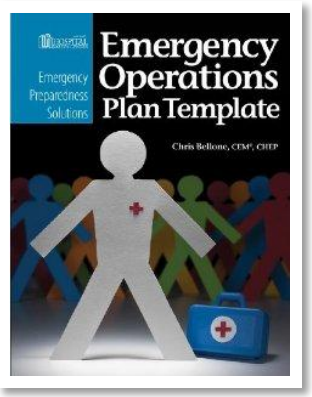
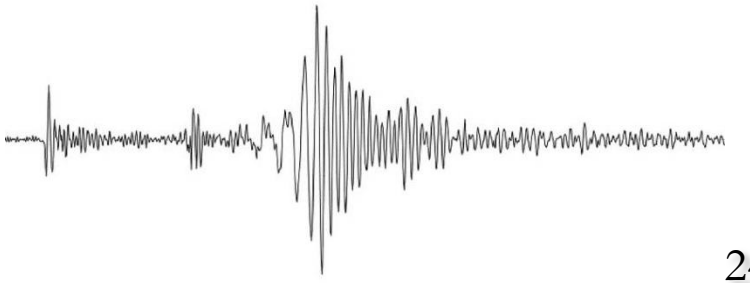
UAVs – Preparedness

- **UAVs can assist in many areas of pre-disaster preparedness and planning:**
  - Mapping, determining hazard areas, evacuation routes and safe zones
  - Determine locations for pre-placement and deployment of resources
  - Preplanning and familiarization for tactical and strategic responses
  - Detection of hazards and provide early warning for the public and responders
  - Support of training and exercise activities



UAVs - Response

- **UAVs can support many missions during the Response Phase of a disaster including:**
  - Provide real time situational awareness including locations of threats and hazards (public and responder safety)
  - Survey damaged or assess conditions in inaccessible, hazardous or contaminated areas (imaging, sensors and monitors)
  - Determine status of roads and critical infrastructure
  - Provide geospatial references and navigation
  - Monitor response operations and effectiveness
  - Monitor the movement of persons, vehicles, resources & provide security
  - Assist Search and Rescue Operations
  - Support or restore communications
  - Survey utilities and utility infrastructure



UAVs - Recovery

- **The Recovery Phase is historically the longest phase of a disaster response:**
  - Survey damaged areas and structures
  - Provide geospatial references and navigation
  - Determine status of roads and critical infrastructure
  - Deliver sensors and monitors conditions in contaminated or unsafe areas
  - Monitor recovery operations and effectiveness
  - Monitor the movement of persons, vehicles and resources
  - Provide support for security operations (evacuated areas)
  - Support or restore communications
  - Survey utilities
  - Monitor weather conditions

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Many recent disasters have seen failed, inadequate or stalled recovery operations. The longer the recover process takes, the higher the cost and the higher the probability that communities will never be fully restored to their pre-disaster conditions!

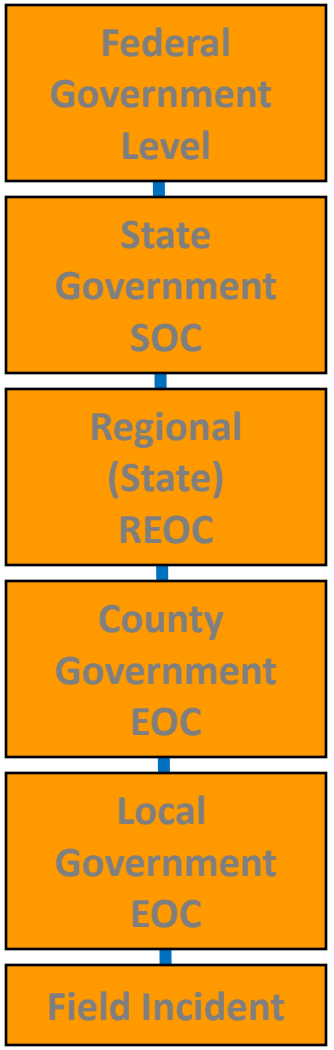
By helping to speed up recovery operations UAVs can help restore communities and lives more quickly and save significant amounts of money.

UAV Applications

- **Unmanned Systems can support a wide variety of emergency response/management missions, activities and disciplines:**
  - Law enforcement
  - Fire service and hazmat operations
  - Emergency Medical Services
  - Search and Rescue (wilderness, marine and urban)
  - Public Health
  - Public Works
  - Environmental management and safety
  - Wildlife and fisheries management
  - Communications systems
  - Site security
  - Utilities assessment
  - Traffic monitoring and management
  - Disaster response and damage assessment

UAVs – Support at all Levels

- **Unmanned Systems can support emergency response and emergency management at all levels:**



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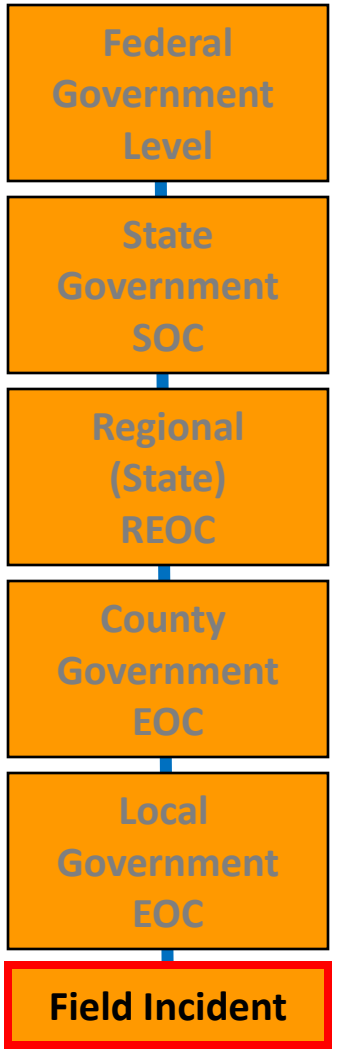

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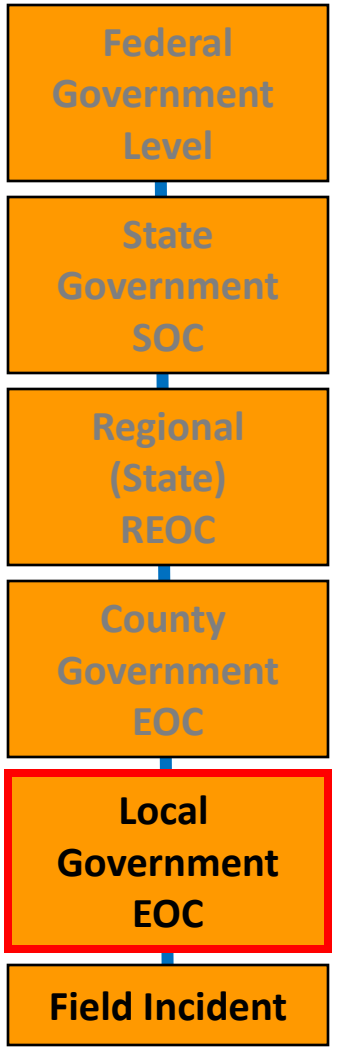

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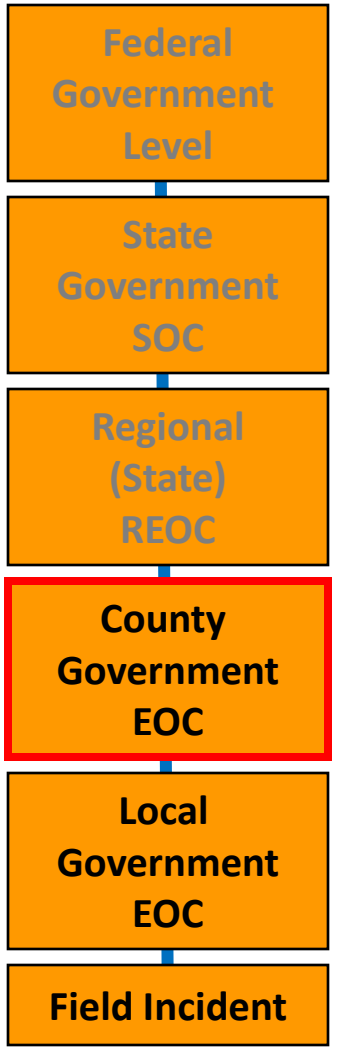

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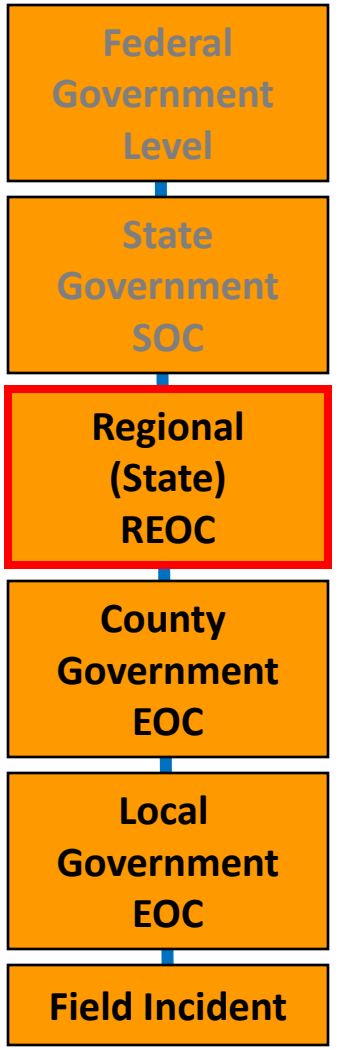

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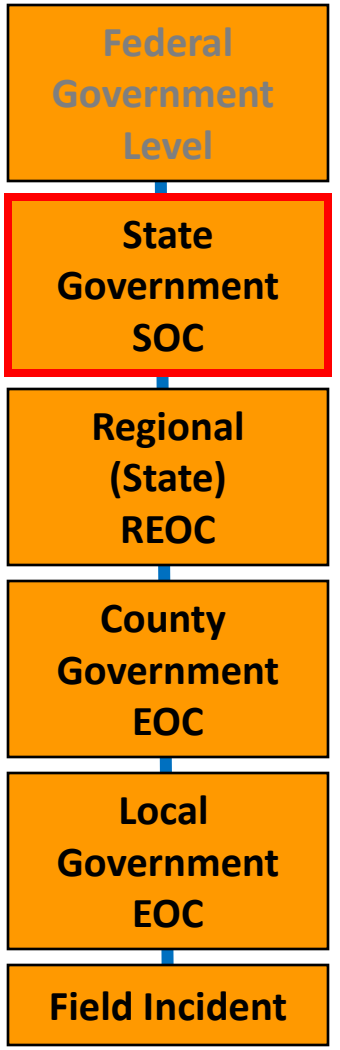

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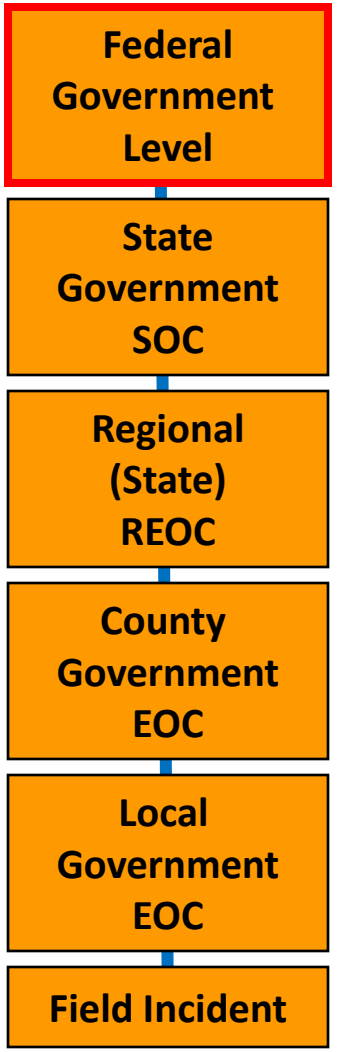
  - **Federal Level (JOC,FEMA, DCO, DCE)**



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  - The vehicles are only one part of the system. Pilot/operator controls, instrumentation packages, and the ability to interface the data received to other existing systems is also critical
  - We are rapidly approaching a time when it may be unethical to put humans in danger if unmanned systems can accomplish the same function

CAW Points of Contact

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